

Entrusted to operate the C.W. Bill Young Cell Transplantation Program, including Be The Match Registry®

January 26, 2012

CDR Sheri Parker Office of Naval Research (ONR 342) 875 N. Randolph St. Arlington, VA 22203-1995

Subject:

Quarterly Performance/Technical Report of the National Marrow Donor

Program

Reference:

Grant Award #N00014-10-1-0204 between the Office of Naval Research and the

National Marrow Donor Program

Dear Cdr. Parker:

Enclosed is subject document which provides the performance activity for each statement of work task item of the above reference for the period of October 1, 2011 to December 31, 2011.

Should you have any questions as to the scientific content of the tasks and the performance activity of this progress report, you may contact our Chief Medical Officer – Dennis L Confer, MD directly at 612-362-3425.

With this submittal of the quarterly progress report, the National Marrow Donor Program has satisfied the reporting requirements of the above reference for quarterly documentation. Other such quarterly documentation has been previously submitted under separate cover.

Please direct any questions pertaining to the cooperative agreement to my attention at 612-362-3403 or at <u>cabler@nmdp.org</u>.

Sincerely, Cala Ablu-Encleson

Carla Abler-Erickson, MA

Sr. Contracts Representative

Enclosure: Quarterly Report with SF298

C: D. Ivery – ACO (ONR-Chicago)

Dr. Robert J. Hartzman, CAPT, MC, USN (Ret)

Jennifer Ng, PhD - C.W. Bill Young Marrow Donor Recruitment and Research Program

J. Rike - DTIC (Ste 0944)

NRL (Code 5227)

Dennis Confer, MD, Chief Medical Officer, NMDP

Stephen Spellman

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| 2. Rapid Identification of Mat patient access are key to preparedne | | • | ciencies tha | at accelerate the search process and increase |
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NATIONAL MARROW DONOR PROGRAM®

Creating Connections. Saving Lives.™

Grant Award N00014-10-1-0204

DEVELOPMENT OF MEDICAL TECHNOLOGY FOR CONTINGENCY RESPONSE TO MARROW TOXIC AGENTS QUARTERLY PERFORMANCE / TECHNICAL REPORT FOR OCTOBER 01, 2011 to DECEMBER 31, 2011 PERIOD 7

Office of Naval Research

And

The National Marrow Donor Program 3001 Broadway Street N.E.
Minneapolis, MN 55413
1-800-526-7809

QUARTER PROGRESS REPORT

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|---|---|--|--|
| IIA.1 Task 1: Secure Interest of Transplant Physicians | Period 7 Activity: • No activity during this reporting period | | |
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| IIA.2 Task 2: Sibling Typing Standard Operating Procedures Period 7 Activity: No activity during this reporting period | | | |

| IIA.3 Task 1: | Period 7 Activity: | | |
|--|--|--|--|
| I.S. Disaster Recovery | No activity during this reporting period | | |
| IIA.3 Task 2: | Period 7 Activity: | | |
| Critical Facility and Staff Related | No activity during this reporting period | | |
| Functions IIP Panid Identification | on of Matched Danors. Objective 1. Increasing the resolution and quality of the ULA testing of | | |
| - | on of Matched Donors – Objective 1: Increasing the resolution and quality of the HLA testing of ry will speed donor selection. | | |
| IIB.1 Task 1: | Period 7 Activity: | | |
| Increase Registry Diversity | • During this past quarter, as an ongoing project of reviewing rare alleles reported on donors in the Be The Match Registry, 207 donors with rare alleles were identified and retyped at a contract lab for HLA-A, B, or DRB1. To date this project has evaluated the rare allele assignment at HLA-A, B, C, or DRB1 in 1730 samples. In total, 1028 (60%) donor typings have changed from the previously reported rare allele and 702 donor typings have been confirmed to carry the reported rare allele. Additionally, four donors whose typing was corrected have since been requested for confirmatory typing on behalf of a search patient. It is unlikely these donors would have been chosen if their typing had not been corrected. | | |
| | IIB.1 Task 2: Evaluate HLA-DRB1 High Res typing – This task is closed. | | |

| IIB.1 Task 4: | Period 7 Activity: | |
|--|--|--|
| Evaluate Buccal Swabs | Sample Storage Research Study (SSRS) | |
| | In September, 2011, 30 donor samples (frozen blood, blood spotted onto filter paper, and 2 buccal swabs for each donor) were sent to two laboratories for the 4 year time point of this study. Analysis of the data shows: 100% accuracy in HLA typing at both Intermediate and High Resolution all sample types contained DNA of sufficient quality and quantity to accurately obtain HLA results at all loci tested (HLA-A, B, C, DRB1, DQB1) the DNA extracted from the buccal swabs appears to be moderately degraded - 5 samples required the use of the second buccal swab for HLA typing A 1.2Kb HLA-C amplicon was successfully generated for both the frozen blood samples and blood spotted onto filter paper samples. Amplification of the buccal swab DNA samples was problematic. However, amplicons under 1.0Kb for the HLA testing were successfully amplified from the buccal swab DNA. | |
| IIB 1 Task 5: | Period 7 Activity: | |
| Enhancing HLA Data for Selected Donors | The AB only donor DRB1 typing project shipped the final DNA samples for testing, AB only donors with repository samples were identified from daily queries of NMDP preliminary patients with zero 6/6 HLA-A/B/DRB1 potential allele matches. | |
| | Results: | |
| | By quarter's end a total of 3,762 samples, corresponding to 211 patient searches, had been shipped for DRB1 testing | |
| | Only two total DRB1 allele matched donors were identified in the project | |
| | • One of the DRB1 matches went to transplant in December as a full 10/10 match for the associated patient with no previous 6/6 potentials | |
| | The second DRB1 match subsequently mismatched the project patient at both the A and C locus | |

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The project abstract submitted for consideration was accepted for a poster at the ASBMT 2012
 Tandem meeting

In addition, a project was initiated to evaluate the benefit of HLA testing DRB1on 825 minority AB only donors. In this period samples were sent to the lab for testing. This project looks at the underlying genetic diversity of the AB only donors in the Be The Match Registry to determine the usefulness of testing this pool who largely do not have stored DNA samples.

IIB 1 Task 6: Maintain a Quality Control Program – This task is closed.

IIB. Rapid Identification of Matched Donors – Objective 2: Primary DNA typing data can be used within the registry to improve the quality and resolution of volunteer donor HLA assignments.

IIB 2 Task 1:

Period 7 Activity:

Collection of Primary Data

• No activity during this reporting period

IIB 2 Task 2: Validation of Logic of Primary Data – This task is closed.

IIB 2 Task 3: Reinterpretation of Primary Data – This task is closed.

IIB 2 Task 4:

Period 7 Activity:

Genotype Lists & Matching Algorithm

• No activity during this reporting period

IIB. Rapid Identification of Matched Donors – Objective 3: Registry data on HLA allele and haplotype frequencies and on the nuances of HLA typing can be used to design computer algorithms to predict the best matched donor.

IIB.3 Task 1:

Period 7 Activity:

Phase I of EM Haplotype Logic

We have implemented the third version of the HapLogic algorithm with increased precision and clarity during this reporting period to include:

- 3 locus matching \rightarrow 5 locus matching
- $x \text{ of } 6 \rightarrow x \text{ of } 8$, x of 10 predictions
- 5 broad race groups → 5 broad and 18 detailed race groups
- Ensuring visibility of NMDP's best matched donors and cords

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| | - | | |
|---|---|--|--|
| | More precision for mismatch searches | | |
| | Better aligned with clinical practice | | |
| IIB 3 Task 2: | Period 7 Activity: | | |
| Enhancement of EM Algorithm • Completed validation of 6-locus haplotype frequency data in context of new matching algorith HapLogic III. | | | |
| | HapLogic III released on 2011-12-19 with significant performance enhancements achieved. | | |
| | First draft of manuscript describing 6-locus haplotype frequency data circulated to co-authors. | | |
| | DPA1~DPB1 haplotype frequency manuscript submitted to journal Immunogenetics. | | |
| IIB 3 Task 3: | Period 7 Activity: | | |
| Optimal Registry Size Analysis | No activity during this reporting period | | |
| IIB 3 Task 4: | Period 7 Activity: | | |
| Target Under- Represented Phenotypes | No activity during this reporting period | | |
| IIB 3 Task 5: Bioinformatics Web Site – This task is closed. | | | |
| IIB 3 Task 6: Consultants to Improve Algorithm – This task is closed. | | | |
| IIB 3 Task 7: Population Genetics – This task is closed. | | | |
| IIB 3 Task 8: Haplotype Matching – This task is closed. | | | |
| IIB 3 Task 9: Global Haplotype/Benchmark – This task is closed. | | | |

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IIB. Rapid Identification of Matched Donors – Objective 4: Reducing the time and effort required to identify closely matched donors for patients in urgent need of HSC transplants will improve access to transplantation and patient survival in the context of a contingency response and routine patient care.

| contingency response and routine patient care. | | |
|---|--|--|
| IIB.4 Task 1: Expand Network Communications | Period 7 Activity: • No activity during this reporting period. | |
| IIB.4 Task 2: Central Contingency Management | Period 7 Activity: Donor testing was completed for the research project to validate the "actual" HLA-A, B, C and DRB1 (8/8) high resolution match rates for CAU, AFA, HIS, and API patients. Testing was done on new samples from swab kits sent to donors that had no remaining stored repository samples. | |
| | Analysis for 10/10 high resolution matches (adding DQB1) on patients where an 8/8 match was identified continued. In this period approximately 530 donors were typed. | |
| IIB.4 Task 3: Benchmarking Analysis – This task is closed. | | |
| IIB.4 Task 4: Expand Capabilities of Collection and Apheresis Centers – This task is closed. | | |
| IIC. Immunogenetic Studies – Objective 1: HLA mismatches may differ in their impact on transplant outcome, therefore, it is | | |

IIC. Immunogenetic Studies – Objective 1: HLA mismatches may differ in their impact on transplant outcome, therefore, it is important to identify and quantify the influence of specific HLA mismatches. In contingency situations it will not be possible to delay transplant until a perfectly matched donor can be found.

| IIC.1 Task 1: | Period 7 Activity: | |
|----------------------|--|--|
| Donor Recipient Pair | | |
| Project | No activity during this reporting period | |

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IIC. Immunogenetic Studies – Objective 2: Even when patient and donor are HLA matched, GVHD occurs so other loci may play a role.

IIC 2 Task 1:

Analysis of non-HLA loci

Period 7 Activity:

- No activity during this reporting period
- **IIC 2 Task 2:** Related Pairs Research Repository This task is closed.
- **IIC 2 Task 3:** CIBMTR Integration This task is closed.

IID. Clinical Research in Transplantation – Objective 1: Clinical research in transplantation improves transplant outcomes and supports preparedness for a contingency response.

IID.1 Task 1:

Observational Research, Clinical Trials and NIH Transplant Center

Period 7 Activity:

Cord Blood Research

- The Duke and St. Louis Cord Blood Bank (SLCBB) created and finalized training and validating the assay methodologies to ensure the generation of consistent results at both testing sites for the study investigating biomarkers associated with cord blood engraftment.
 - o Testing using this third laboratory, SLCBB, is under development to determine whether the poor reliability is due to center-specific or assay related issues.
- Contract negotiations with SLCBB were initiated and finalized.

IID.1 Task 2: Research with NMDP Donors – This task is closed.

IID.1 Task 3:

Expand Immunobiology Research

Period 7 Activity:

The CIBMTR IBWC met monthly during the quarter to discuss progress on ongoing research studies

• Biostatistical analysis continued on ongoing studies.

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Development of Medical Technology for Contingency Response to Marrow Toxic Agents April 01, 2011 through June 30, 2011

ACRONYM LIST

| AABB | American Association of Blood Banks | HR | High Resolution |
|---------|---|--------|--|
| AFA | African American | HRSA | Health Resources and Services Administration |
| AGNIS | A Growable Network Information System | HSC | Hematopoietic Stem Cell |
| AML | Acute Myelogenous Leukemia | IBWC | Immunobiology Working Committee |
| ABD | Antigen Binding Domain | IDM | Infectious Disease Markers |
| API | Asian Pacific Islander | IHWG | International Histocompatibility Working Group |
| ARS | Acute Radiation Syndrome (also known as Acute Radiation Sickness) | IPR | Immunobiology Project Results |
| ASBMT | American Society for Blood and Marrow Transplantation | ICRHER | International Consortium for Research on Health Effects of Radiation |
| ASHI | American Society for Histocompatibility and Immunogenetics | IND | Investigational New Drug |
| B-LCLs | B-Lymphoblastoid Cell Lines | IS | Information Services |
| BARDA | Biomedical Advanced Research and Development Authority | IT | Information Technology |
| BBMT | Biology of Blood and Marrow Transplant | IRB | Institutional Review Board |
| ВСР | Business Continuity Plan | JCAHO | Joint Commission on Accreditation of Healthcare Organizations |
| BCPeX | Business Continuity Plan Exercise | KIR | Killer Immunoglobulin-like Receptor |
| BMCC | Bone Marrow Coordinating Center | MDACC | MD Anderson Cancer Center |
| BMDW | Bone Marrow Donors Worldwide | MDS | Myelodysplastic Syndrome |
| BMT | Bone Marrow Transplantation | MHC | Major Histocompatibility Complex |
| BMT CTN | Blood and Marrow Transplant - Clinical Trials Network | MICA | MHC Class I-Like Molecule, Chain A |
| BODI | Business Objects Data Integrator | MICB | MHC Class I-Like Molecule, Chain B |
| BRT | Basic Radiation Training | MKE | Milwaukee |
| C&A | Certification and Accreditation | MRD | Minimal Residual Disease |
| CAU | Caucasian | MSKCC | Memorial Sloan-Kettering Cancer Center |
| CBMTG | Canadian Blood and Marrow Transplant Group | MSP | Minneapolis |
| CBB | Cord Blood Bank | MUD | Matched Unrelated Donor |
| CBC | Congressional Black Caucus | NAC | Nuclear Accident Committee |

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| CBS | Canadian Blood Service | NCBM | National Conference of Black Mayors |
|-----------|--|---------|---|
| CBU | Cord Blood Unit | NCI | National Cancer Institute |
| CHTC | Certified Hematopoeitic Transplant Coordinator | NEMO | N-locus Expectation-Maximization using |
| | | | Oligonucleotide typing data |
| CIBMTR | Center for International Blood & Marrow | NHLBI | National Heart Lung and Blood Institute |
| | Transplant Research | | |
| CIT | CIBMTR Information Technology | NIH | National Institutes of Health |
| CLIA | Clinical Laboratory Improvement Amendment | NIMS | National Incident Management System |
| CME | Continuing Medical Education | NK | Natural Killer |
| CMF | Community Matching Funds | NLE | National Level Exercise |
| COG | Children's Oncology Group | NMDP | National Marrow Donor Program |
| CREG | Cross Reactive Groups | NRP | National Response Plan |
| CSS | Center Support Services | NST | Non-myeloablative Allogeneic Stem Cell |
| | | | Transplantation |
| CT | Confirmatory Testing | OCR/ICR | Optical Character Recognition/Intelligent Character |
| | | | Recognition |
| CTA | Clinical Trial Application | OIT | Office of Information Technology |
| DC | Donor Center | OMB | Office of Management and Budget |
| DHHS-ASPR | Department of Health and Human Service – | ONR | Office of Naval Research |
| | Assistant Secretary Preparedness and Response | | |
| DIY | Do it yourself | P2P | Peer-to-Peer |
| DKMS | Deutsche Knochenmarkspenderdatei | PBMC | Peripheral Blood Mononuclear Cells |
| DMSO | Dimethylsulphoxide | PBSC | Peripheral Blood Stem Cell |
| DoD | Department of Defense | PCR | Polymerase Chain Reaction |
| DHHS-ASPR | Department of Health and Human Services – | PSA | Public Service Announcement |
| | Assistant Secretary for Preparedness and | | |
| | Response | | |
| DNA | Deoxyribonucleic Acid | QC | Quality control |
| DR | Disaster Recovery | RCC | Renal Cell Carcinoma |
| D/R | Donor/Recipient | RCI BMT | Resource for Clinical Investigations in Blood and |
| | | | Marrow Transplantation |
| EBMT | European Group for Blood and Marrow | REAC/TS | Radiation Emergency Assistance Center/Training Site |

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| | Transplantation | | |
|-------|--|-------------------|--|
| EDC | Electronic Data Capture | RFP | Request for Proposal |
| EFI | European Federation of Immunogenetics | RFQ | Request for Quotation |
| EM | Expectation Maximization | RG | Recruitment Group |
| EMDIS | European Marrow Donor Information System | RITN | Radiation Injury Treatment Network |
| ENS | Emergency Notification System | SBT | Sequence Based Typing |
| ERSI | Environment Remote Sensing Institute | SCTOD | Stem Cell Therapeutics Outcome Database |
| FBI | Federal Bureau of Investigation | SG | Sample Group |
| FDA | Food and Drug Administration | SLCBB | St. Louis Cord Blood Bank |
| FDR | Fund Drive Request | SLW | STAR Link® Web |
| FLOCK | Flow Cytometry Analysis Component | SSA | Search Strategy Advice |
| Fst | Fixation Index | SSO | Sequence Specific Oligonucleotides |
| GETS | Government Emergency Telecommunications Service | SSP | Sequence Specific Primers |
| GCSF | Granulocyte-Colony Stimulating Factor (also known as filgrastim) | SSOP | Sequence Specific Oligonucleotide Probes |
| GIS | Geographic Information System | SSRS | Sample Storage Research Study |
| GvHD | Graft vs Host Disease | STAR [®] | Search, Tracking and Registry |
| HCS | HealthCare Standard | TC | Transplant Center |
| HCT | Hematopoietic Cell Transplantation | TED | Transplant Essential Data |
| HEPP | Hospital Emergency Preparedness Program | TNC | Total Nucleated Cell |
| HHQ | Health History Questionnaire | TSA | Transportation Security Agency |
| HHS | Health and Human Services | UI | User Interface |
| HIPAA | Health Insurance Portability and Accountability | UML | Unified Modeling Language |
| | Act | | |
| HIS | Hispanic | URD | Unrelated Donor |
| HLA | Human Leukocyte Antigen | WGA | Whole Genome Amplification |
| HML | Histoimmunogenetics Mark-up Language | WMDA | World Marrow Donor Association |
| | | WU | Work-up |